

THE ISLAND OF OAHU.

Irrigation on Oahu.

IN ORDER that the sugar industry of Oahu should thrive and become a permanent and paying one, it became an absolute necessity to develop water in practically unlimited quantities for irrigating the thousands of acres devoted to sugar cane culture. The following taken from the report of two prominent engineers, Messrs. James D. Schuyler and G. F. Allardt, will be found interesting, and the results so far obtained based upon their report demonstrate the fact that the artesian supply upon the various extensive plantations is practically unlimited, as the addition of new wells does not diminish the flow of others, and according to their report there seems to be a more or less direct connection between the wells and the streams from the mountains:

"The discovery of the possibility of obtaining a supply of flowing water by deep artesian borings around the margin of this

ise, covenant and agree with said Planter, to admit him as a Share Planter and agricultural laborer upon the Honolulu Plantation at Aiea and adjacent country in Ewa, on the Island of Oahu, and in furtherance of said agreement and to fully accomplish the said object, hereby agrees:

I. To authorize and permit said Planter to enter into and occupy for the purpose of cultivation with sugar cane, on the profit-sharing system, as below specified, in common with other planters to be so admitted by the Company of that section of land, described in Honolulu Plantation maps as Field No. covering in all about acres now planted with sugar cane by the Company and standing debited with a labor cost of dollars on the books of the Company, of which amount the Planter hereby agrees to repay his pro rata, and also to loan and advance not to exceed dollars per month of twenty-six days' service performed, while he faithfully performs his side of this contract, for his living expenses, which amount is to be re-

any expense incurred in separating at the mill all dead, sour or other worthless cane which may have been loaded on the cars or other carriers; to return to the Company from his share of proceeds, all advances made to him under Section I and his pro rata of the labor or cost debited against this field as above specified in Section I; to pay in like manner for the actual cost of all labor procured and furnished by the Company in order to well and properly cultivate and irrigate such cane upon default of Planter to so cultivate and irrigate; to well and carefully carry out and perform all instructions and directions of the Company regarding the cultivation, irrigation and harvesting of such cane.

IV. It is likewise hereby agreed that all work, labor and service to be performed by Planter under this agreement shall be subject to the supervision and shall be done to the satisfaction of the Company in all cases, and if the Company shall consider it necessary to employ extra labor to do the work satisfactorily, either in cultivation or cutting and loading of cane, the Company may so employ extra labor, and all costs of same shall be charged to and deducted from Planter's share, with interest at the rate of 9 per cent per annum for any labor charged up for cultivation. The Planter shall always be subject to the supervision or order of the Company, and the amount of water to be used for irrigation and the manner of using it shall be at the sole discretion and judgment of the Company.

V. For the cane grown and delivered on the railroad cars furnished by the Company, under this agreement, the said Company shall pay for each ton of two thousand pounds the sum of dollars and cents, and the said Planter shall be entitled to receive as his share for all services by him done and performed hereunder, such proportionate part as his labor bears to the entire amount of labor and services rendered on said premises by all the Planters participating in the cultivation thereof.

VI. This agreement may be terminated at any time by the Company and upon two months' notice by the Planter, the Planter being entitled upon such settlement, to wages at the rate of dollars per month for the term of his service rendered, deducting therefrom the advances as aforesaid under article I.

VII. The Planter shall not have the right to transfer or assign his share to another without the written consent of the Company, and in case of any such transfer it shall not be recognized, and all settlements shall be made with the original Planter or his heirs or legal representatives in case of death.

VIII. The Planter, together with his co-workers, shall have the right to inspect the weighing of their cane at any time.

IX. The Company shall in no way be held liable for damages to said crop or any

vances as aforesaid; or settlement may be deferred until the crop is harvested, and then it shall be made upon the terms hereof for the proportionate time given by said Planter hereunder. In case of accident to or sickness of said Planter whereby he is prevented from performing the labor under this agreement, if he shall not supply the labor in place of his own, the Company may do so and a proportionate amount of said Planter's share under this agreement shall be deducted for the time lost.

XI. This agreement, in so far as the cultivation and harvesting is concerned, shall terminate and be at an end when the last cane upon the fields to be cultivated hereunder shall have been placed upon the cars and weighed, and settlement shall be made not later than three months thereafter. It is further agreed that during said period of three months the Planter shall remain upon the Plantation and perform such labor as may be required by the Company.

XII. It is agreed that in all cases where the Company is concerned its Manager shall be its representative and shall be so recognized and treated by the Planter.

In witness whereof, the said Company, by its manager, and the said Planter have hereunto and to another instrument of like tenor and date affixed their signatures this day and year first aforesaid.

Signature of Planter,

HONOLULU PLANTATION CO.
By its Manager.

Ewa, the Banner Plantation

There is perhaps no other plantation in the entire Hawaiian Islands, which, for the ten years it has been in existence, has grown so rapidly and has produced so much sugar per acre as the Ewa Plantation Company's. Briefly stated, the property is some eighteen miles from Honolulu, and is reached over the railroad system of the O. R. & L. Co., and has a total acreage available for cane of approximately 7000 acres of leased lands, of which area 6,500 acres is under cultivation and planted to the Lahaina variety.

The first cane planted by the company was in 1890 and comprised 40 acres planted for seed, since which period the plantation has grown by leaps and bounds, not only in the extent of cane area but the number of tons of sugar produced to the acre. The greatest elevation that cane is planted is 200 feet, while the character of the soil varies from a light red on the uplands to a black loam on the low lands, and may be classed as good and extra good soil. A complete analysis of the soils in the various fields is regularly kept, in order that it can be readily ascertained just what amount of fertilizer may be required.

A notable feature of this plantation is the high average yield of long and short rattoons when compared to plant cane, which shows clearly that it is not the soil altogether that enables such a yield as ten and twelve tons of sugar to the acre, but the methods of cultivation, fertilization, proper distribution of water, as likewise deep plowing. It is evident, indeed, that extra deep plowing and heavy fertilization are the two principal agencies that have produced the results. In 1894 the expense for fertilizer was \$3.75 per acre, whereas in 1900 the expense was \$41.37 per acre.

In order to carry out the idea of extra deep plowing the company imported from John Fowler & Co. (Leeds) Limited, London, what is called an "Oliver" plow, which gave such great satisfaction that an additional order was placed for the Wai'alua plantation, of which property Messrs. Castle & Cooke of Honolulu are likewise the agents.

With the "Oliver" plow the soil can be turned over to a depth of fully two feet. It is a single share plow of extra heavy parts and built solid in order to stand the severe strain put upon it. In fields where the much dreaded growth of "Lantana" has taken hold of the soil the "Oliver" plows remove it out by the roots and effectually kill it.

PLANT CANE.

The average sugar output per acre of plant cane since 1893 is as follows: 1894, 8.01; 1895, 6.40; 1896, 8.40; 1897, 9.02; 1898, 11.26; 1899, 10.24; 1900, 10.15.

The crop of plant cane for 1901 will run a little higher than the previous year.

LONG AND SHORT RATTOONS.

Average sugar output per acre: 1894, 2.72; 1895, 6.19; 1896, 7.16; 1897, 5.45; 1898, 8.08; 1899, 10.67; 1900, 11.46.

The record of all fields taken off this year



Ewa Plantation Mill

Island has been of incalculable value to all property interests, and has compensated in a measure for the loss occasioned by the perpetual robbery of the waters that fall so copiously upon the mountains, by the porous and thirsty earth, and for the waters lost during torrential storms by rapid drainage into the sea. On no other island of the group has nature provided for such compensation, and even here the geological formation is so different from that of any other region the world over where artesian water is obtained by boring, that no scientific man would have risked his reputation in predicting the possibility of securing flowing wells by boring in the volcanic and coral formations of this country before success had demonstrated the fact. There seems to be a more or less direct connection between the wells and the streams from the mountains, and we have been told of at least one well that flows muddy water some hours after a heavy storm.

"The springs that appear at and above sea level all around the island, and the artesian wells undoubtedly have one and the same source of supply and are fed from the same interior basin that overflows at or near sea level. This supply is maintained by direct absorption of the rainfall by the porous lava rock and by infiltration from the mountain streams. The fact that water will rise in the well-pipes a few feet higher than the level at which the springs appear, indicates that the open well-pipe affords a freer outlet than is afforded by the seams and crevices through which the water of the springs is forced, permitting the water to rise to nearly its full static head. The probabilities are that the island is surrounded by deep, thick strata of impervious clay or sedimentary formation, built up by slow deposit from the wash of ages by the streams of the islands; that these strata lap onto the land to or about the height the water rises in the wells, brought up by the gradual rise of the island above sea level, and that these strata prevent the escape of the waters into the sea beneath them.

"Experience thus far indicates that flowing water is almost certain to be obtained anywhere around the margin of the island where the surface is lower than the limits above mentioned."

Co-operative Labor Contract Adopted by Managers on the Island of Oahu.

This Agreement, made this day of, 1901, between the Honolulu Plantation Company, a corporation, incorporated under the laws of the State of California, of the first part, hereinafter called the Company, and, of the second part, hereinafter called the Planter,

WITNESSETH: That in consideration of the promise, covenant and agreement of each of said parties to the other moving, and in further consideration of the faithful observance and performance of the terms and conditions of this agreement as below set forth, said Company doth hereby prom-

turned by the Planter without interest as below set forth.

II. The Company further agrees to furnish without any charge as follows:

Lodgings sufficient for Planter's use and to keep the same in ordinary repair, on Planter's careful and proper use thereof; fuel for domestic use, to be cut and gathered by Planter at such places as the Company shall designate; tools in the first instance for irrigating purposes, to be kept in repair or replenished by Planter at his own



Theoretical Formation of Island of Oahu Water Sources

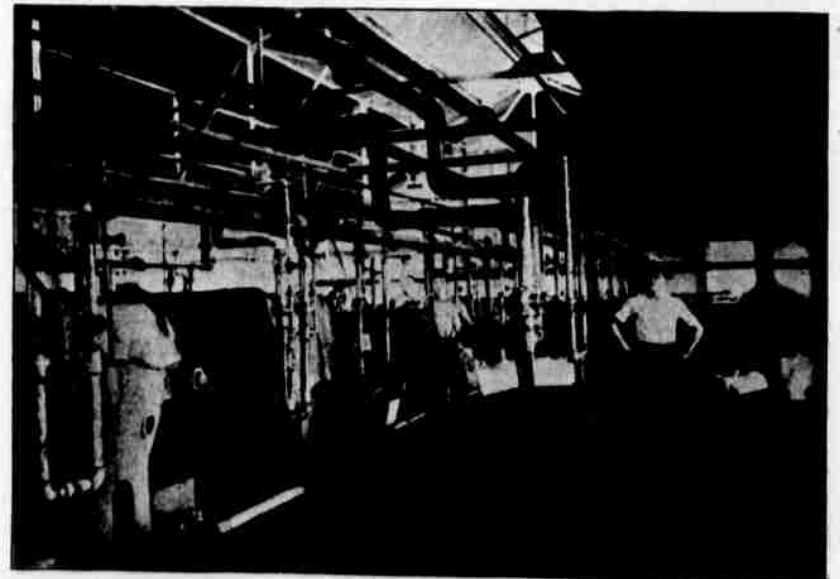
expense; water in main plantation ditches for irrigation purposes (whence it must be conducted by Planter at his expense to the cane fields and there carefully and economically used for irrigating the cane); such fertilizers as it may deem necessary to be used in cultivating such premises; and when required for harvesting purposes, the Company will place movable tracks through the cane fields at distances of not over four hundred feet apart, and place thereon railroad cars for the transportation of the cane to the mill, or to furnish other sufficient transportation of the cane to the mill.

And the Planter in consideration aforesaid, agrees that upon notice by the Company he will go to said Honolulu Plantation and will there faithfully do and perform all things to be done and performed by him under this agreement as follows, to wit:

III. With such other planters as the Company may designate to cultivate thoroughly and well, and to properly irrigate the cane growing and to be grown during the term hereof on the section of land mentioned in Section I hereof, until said cane shall be matured and ripe, and till the Company shall direct that said cane shall be cut and harvested; to use the water furnished for irrigation with economy and care; to clean and strip said cane not less than twice while growing; to keep all roads and ditches in said premises clean and free from weeds; to carefully apply or pay for the application of such fertilizers as the Company may furnish for said premises; to cut and load said cane on the railroad cars or other carriers furnished by the Company and to carefully prevent the placing on said cars or other carriers of any sour, dead or worthless cane; and in cutting and harvesting the crop, to cut canes close to the ground and to cut tops off properly; to pay out of Planter's share to the Company, if the Company furnishes labor to assist in cutting and loading the cane, \$..... per ton of cane, so cut and loaded; to pay

portion thereof by fire, storms or for unavoidable delays in the mill, pumps, or for delays caused by strikes of workmen on the Honolulu Plantation or for any accidents and delays which are beyond the control of the Employer.

X. In case of the death of the Planter during the term of this agreement, the estate shall be entitled to an immediate settlement at the rate of dollars (\$.....) per month, deducting ad-



Filter Press Room, Mill of Wai'alua Plantation